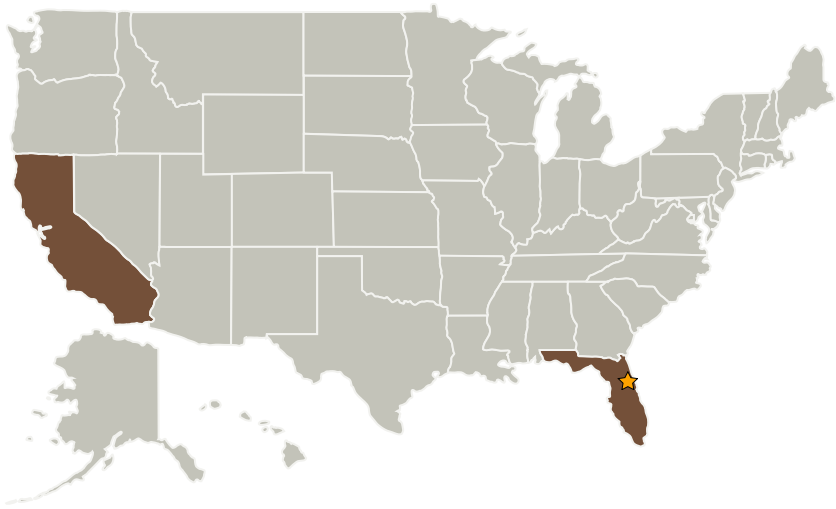
# Multipurpose Electric Potential Sensor for Spacecraft Applications, Phase I

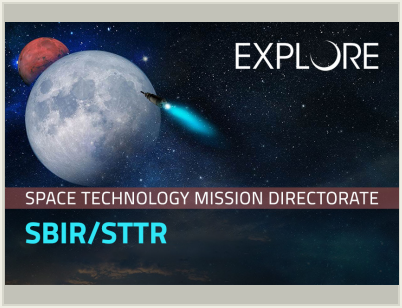
Completed Technology Project (2004 - 2004)

## Project Introduction

This proposal is based on a new, compact, solid-state electric potential sensor that has over an order of magnitude lower voltage noise than the prior state-of-the-art. This proposal offers configuration of miniature sensors mounted on the extremities of a spacecraft or lander to measure the local electric potential, field, and field gradients at state-of-the-art levels. This technology has never before been adapted for specific NASA applications. This program will constitute a transition from DOD applications to NASA. We propose to study NASA requirements, set ranges for mission parameters, and optimize the electric sensor for related applications. We will design and test various configurations, and select space-qualified components for building the sensor. We expect to produce a sensor for detection of electrostatic field and its hazards with sensitivity beyond what is offered by current technology in use. The sensor has applications in the areas of military use, medical applications, lightning detection and prediction, geological science, and other scientific instrumentation.

## Primary U.S. Work Locations and Key Partners






Multipurpose Electric Potential Sensor for Spacecraft Applications, Phase I

## Table of Contents



## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Kennedy Space Center (KSC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

# Multipurpose Electric Potential Sensor for Spacecraft Applications, Phase I

Completed Technology Project (2004 - 2004)

| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Kennedy Space Center(KSC) | Lead Organization | NASA Center | Kennedy Space Center, Florida |
| Quantum Applied Science and Research Inc | Supporting Organization | Industry | San Diego, California |

| Primary U.S. Work Locations | |
|---|---|
| California | Florida |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Yongming Zhang

## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - TX01.2 Electric Space Propulsion
    - TX01.2.4 Electrothermal